LBP 99-1

February 3, 1999

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judges:
Peter B. Bloch, Presiding Officer
Thomas D. Murphy, Special Assistant

In the matter of HYDRO RESOURCES, INC. (2929 Coors Road Suite 101 Albuquerque, New Mexico 87120)	Docket No. 40-8968-ML Re: Leach Mining and Milling License ASLBP No. 95-706-01-ML

PARTIAL INITIAL DECISION
(Waste Disposal Issues)

This decision determines the merits of the Written Presentations on Liquid Waste Disposal Issues filed on November 9, 1998 by Eastern Navajo Diné Against Uranium Mining (ENDAUM), the Southwest Research and Information Center (SRIC), Grace Sam and Marilyn Morris (Intervenors).[1]

I have concluded that Intervenors' request for relief should be denied. Intervenors erroneously rested a substantial portion of their argument on 10 C.F.R. § 40.31(h) and on

---

[1]Hydro Resources, Inc. (HRI) filed it "ResponseTo Intervenors' November 9, 1998 Briefs in Opposition to Application For a Materials License With Respect to Liquid Waste Disposal Issues" on December 9, 1998 (HRI Response). The Staff of the Nuclear Regulatory Commission (Staff) filed its "Response to Intervenor Presentations On Liquid Waste Disposal Issues" on December 16, 1998 (Staff Response).

10 C.F.R. Part 40, Appendix A, which apply to mill tailings facilities "at sites formerly associated with such milling." Although portions of Appendix A do apply to injection mining, Intervenors are incorrect in their assumption that the Appendix is generally applicable to this project.

For reasons that will be discussed below, I have concluded that the licensing standard that must be met by HRI is that there is adequate protection of public health and safety and adequate consideration of environmental issues related to waste disposal, both during operations and cleanup. 10 C.F.R. § 40.32(c) and (d); National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 *et seq.* (NEPA). HRI's waste products are far less hazardous than mill tailings and its precautions for the treatment and disposition of wastes are adequate. Intervenors have not raised any issues on which HRI has not carried its burden of demonstrating adequate protection of public health and safety and adequate consideration of environmental issues.

I. Background: Description of the HRI Project

HRI has applied for and received a materials license to conduct in situ leach mining (ISL) on Sections 8 and 17 in Church Rock, New Mexico, and on two sites in Crownpoint,

New Mexico, "Unit 1" and "Crownpoint."[2] HRI's application proposes processing the uranium extracted from each site at its Crownpoint processing facility.[3]

Solution mining produces different types of effluents that could be released to the environment: (1) gaseous emissions and airborne particulates resulting from the injection of groundwater enriched with dissolved oxygen and bicarbonate ions ("lixiviant") and from the drying of yellowcake, and (2) liquid waste associated with well field processing and aquifer restoration. *Final Environmental Impact Statement: To Construct and Operate the Crownpoint Uranium Solution Mining Project*, NUREG-1508 (February 1997)(FEIS) at 2-5, 6, 14 and 16. This decision deals only with liquid effluents.

Some liquid waste occurs because HRI will inject lixiviant into rock formations in which recoverable quantities of uranium oxide have been identified. The lixiviant will cause the uranium oxide to be dissolved. By operating "production wells" near the injection sites, HRI will withdraw somewhat more water from the formation than it has injected into it. This causes a "negative pressure" that causes the pregnant (i.e., uranium rich) lixiviant to flow

---

[2]HRI has been granted a license (SUA-1508, January 5, 1998) (The License) to conduct in situ leach (ISL) mining. It submitted its initial application on April 13, 1988, and proposed to mine on Section 8 in Church Rock. Hearing Record Accession Number (ACN) 8805200339, Application for Materials License (April 13, 1988). HRI later amended the application to include processing in Crownpoint and mining at Section 17, Unit 1 and Crownpoint. Consolidated Operations Plan, Rev. 2.0 ("COP Rev. 2.0"), at 2 Hearing Record ACN No. 9708210179 (August 15, 1997). See also Hearing Record, ACNs 8805200339 (Application for Materials License, April 13, 1988), 9509080065 (Environmental Assessment of Unit 1, January 6, 1992), 9211399381 (forwarding documents, including Crownpoint project technical report, July 31, 1992), and 9211300077 (Requests NE quarter of Section 17 be included in Churchrock mining project, September 28, 1992).

[3]COP Rev. 2.0 at 2. See also Hearing Record ACN 8811040138 (HRI changes location of the proposed Central Processing Facility) (October 12, 1988).

toward the production wells, where it is pumped to the surface. Above ground, the pregnant lixiviant is subject to three treatments. One removes the uranium oxide through ion exchange (using IX resin). Another assures that radon gas will be kept under pressure so that the lixiviant may be safely reinjected into the underground formations without being discharged to the atmosphere. Still another treatment removes 99% of the radium from the production bleed, which would be subsequently treated and then disposed of by "an NRC-approved disposal method." FEIS at 2-16.

After the uranium oxide is removed from the pregnant lixiviant through ion exchange, the ion exchange resin is subject to a chemical process, called elution or "stripping," which uses a chloride salt to replace the uranium oxide that was bound to the resin. The solution containing the uranium oxide is then dewatered, filtered and dried in a vacuum drier to produce uranium oxide concentrate or yellowcake. The moisture from the drying chamber is filtered and condensed, reducing emissions almost to zero. FEIS at 2-9 to 2-12.

The production bleed contains radium, 99% of which is removed from the process wastewater. Because 1% of the radium remains in the production bleed, retention ponds at injection mining sites are necessary. These ponds are designed to promote evaporation and to control the by-product material contained in the production bleed. *See* FEIS, § 2.1.1.5, at 2-12. During any injection mining operations, HRI would be required to inspect the retention ponds, measure the storage space left in the ponds (typically referenced as the "pond freeboard"), and check for evidence of any pond leaks. *See id.*; *see also* HRI License Condition 10.5. The retention ponds will have double synthetic liners to prevent any leaks.

See FEIS, § 2.1.1.5, at 2-12; *see also* § 2.3 of HRI's COP, at 29, providing a further description of the liners to be used.

At the end of injection mining (also called *in situ leach* or ISL mining) operations, the radium-contaminated sludge at the bottom of the retention pond and any other leftover byproduct material, will be transported off site for disposal at a licensed facility. *See* FEIS, § 2.1.2.3, at 2-16 to 2-17. Injection mining does not produce any mill tailings. *See* Affidavit of Christopher A. McKenney, attached as Staff Exhibit 10 to "NRC Staff's Response to Motion for Stay, Request for Prior Hearing, And Request for Temporary Stay," at ¶ 30. Indeed, no permanent onsite by-product waste disposal is authorized by HRI's license. *See* HRI License Condition 9.6.

HRI claims that this process is low risk. It asserts that there have been 25 years of ISL uranium mining in the United States with "no significant impacts to human health or the environment."[4] It asks that the Presiding Officer attach significance to the failure of Intervenors to cite any adverse incidents.

II. Applicable Law

A. NRC Regulations

The principal regulatory standards governing this application for a license are 10 C.F.R. § 40.32(c) and (d), which mandate protection of the public health and safety. Generally speaking, a license may be granted if, "The applicant's proposed equipment, facilities and procedures are adequate to protect health and minimize danger to life or

---

[4]HRI Response at 2, footnotes 9 and 10.

property." For Intervenors to challenge successfully the HRI license, they must establish that HRI has failed to demonstrate the adequacy of its proposed equipment, facilities and procedures.

1. Reliance on 10 C.F.R. § 40.31(h) and Part 40, Appendix A

The Intervenors erroneously rely on 10 C.F.R. § 40.31(h), which refers generally to the provisions of 10 C.F.R. Part 40, Appendix A,"Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content" (Appendix A). As we shall see, below, these regulatory provisions generally are not relevant to the inadequacy of HRI's license application. *See* SRIC Disposal Brief, at 9-12; Morris Disposal Brief, at 2-4.

On its face, 10 C.F.R. § 40.31(h) states that it applies "at sites formerly associated with such [uranium or thorium] milling." Intervenors do not present any argument that explains why they believe the section applies to the HRI license even though the HRI site is not "formerly associated with such milling." The language of the section simply does not apply to the HRI site. The legislative history also strongly suggests that 10 C.F.R. § 40.31(h) and 10 C.F.R. Part 40, Appendix A, were designed to address the problems related to mill tailings and not problems related to injection mining. See Hydro Resources' Response at 9-16; Staff Response at 5-21. The history of 10 C.F.R. § 40.31(h) demonstrates that it does not apply to injection mining license applicants, and in implementing the

general requirements of 10 C.F.R. § 40.32 instead, the Staff properly applies only those Appendix A criteria that apply to injection mining.

Similarly, Intervenors have argued that Part 40 Appendix A is generally applicable to ISL mining. It is not. The principal purpose of Appendix A relates to "sites formerly associated with such [uranium or thorium] milling." Hence, the criteria of Appendix A do not apply wholesale to the HRI license. Specific criteria within Appendix A are applicable to this license only when they explicitly apply to ISL mining.

2. Applicability of Part 40 Appendix A Criteria

Criterion 2 is the only one of the Appendix A criteria that references ISL mining.[5] The Criterion 5A provisions also are applicable to HRI's proposed operations because ISL mining operations generally use surface impoundments, and because such operations produce "byproduct material." *See* 10 C.F.R. § 40.4 "bybroduct material) definition; *see also* Staff's December 1997 SER at 29 (recognizing applicability of criteria 5A provisions to HRI's proposed operations). The detailed basis for the Appendix A criteria, promulgated in

---

[5] Criterion 2, which the intervenors do not discuss, states in full as follows:

> To avoid proliferation of small waste disposal sites and thereby reduce perpetual surveillance obligations, byproduct material from in situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from small remote above ground extraction operations must be disposed of at existing large mill tailings disposal sites; unless, considering the nature of the wastes, such as their volume and specific activity, and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantages of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations.

1980, are set forth in a Generic Environmental Impact Statement (GEIS). 45 Fed. Reg. at 65529 col.1. The GEIS focused on the impacts of conventional uranium milling operations, while giving limited consideration to the impacts of non-conventional uranium recovery processes such as ISL mining. *See* GEIS, § 1.2, "Scope of Statement," at 1-1 to 1-2.[6]

Intervenors have focused their attention on Criterion 7. However, Criterion 7A explains that the purpose of the required detection monitoring program is to detect "leakage of hazardous constituents *from the disposal area.*" [Emphasis added.] I infer that this requirement applies to mill tailings, which are left in a "disposal area" and not to ISL mining. The definition of "disposal area," found in the beginning of Criterion 6, refers to an area of a site put aside for controlled, long-term storage of waste after a project is completed. That Criterion is inapplicable here because there will not be any waste byproduct material permanently disposed of on this site.

Staff correctly states, at p. 19 of the Staff Response:

> In arguing the applicability of Criterion 7A, Ms. Sam and Ms. Morris cite the 1995 "Staff Technical Position on Effluent Disposal at Licensed Uranium Recovery Facilities" (Effluent STP). *See* Morris Disposal Brief, at 4 n.1, 10, and 10 n.6. The Effluent STP provides a general guide to the NRC staff in reviewing waste disposal proposals at both uranium mills and ISL facilities. *See* Effluent STP, at 1. As a result, its wording is necessarily broad. Consistent with its status as a general guidance document, the wording of the applicable regulations controls for purposes of legal enforcement. *See id.*, at 2.

---

[6]In October 1980, 10 C.F.R. § 40.31(h) and Appendix A were promulgated in final form. *See* 45 Fed. Reg. 65521, 65528 col.2, and 65529 col.1 (October 3, 1980). At 65529, the 1980 Statement Of Considerations erroneously refers to "a new paragraph (g)" being added to 10 C.F.R. § 40.31. The error is corrected at 46 Fed. Reg. 13497 (February 23, 1981).

In license proceedings, guidance documents provide "guidance" but it is the agency's regulations, promulgated after notice and comment, that control. 10 C.F.R. § 2.1239(a).

Intervenors have argued that HRI's license application is deficient because it does not specify in detail the arrangements for surface impoundments. I reject this argument. HRI complied with these regulations when it stated in the COP 2.0 that:

> all CUP surface impoundments will be equipped with two impermeable synthetic membrane liners: an inner 30 mil Hypalon liner, or equivalent, and an outer liner 36 mils thick made of Hypalon, or equivalent (1 mil=0.001 inch). A space 4 to 5 inches thick between the two liners will contain sand, or some other (granular) porous medium, and a drainage network of open piping, forming an underdrain leak detection system. The (inner) liner will provide secondary containment for any leakage that may occur.

NRC recognized HRI's commitment in this regard in the SER:

> HRI has committed to using a double-lined, impermeable synthetic membrane for its waste retention ponds in accordance with 10 C.F.R. Part 40, Appendix A requirements. The liners will be separated by 4-5 inches of sand or equivalent medium, and a drainage network of open piping which forms an underdrain leak detection system. The inner liner will provide secondary containment for any leakage that may occur. HRI states that it will conduct daily inspections for leakage, and that fluid found in the leak detection system will be cause for immediate corrective action, including notification of the NRC.

SER at 30. In addition the Staff has imposed license condition 10.26, requiring NRC acceptance of the adequacy of waste retention ponds prior to lixiviant injection. License SUA-1508 at 8. Intervenors have not persuaded me that these specifications are deficient.

3. Applicability of Part 20

On pages 29-37 of their brief, ENDAUM and SRIC claim that HRI has failed to provide specific information and analyses in the license application required by 10 C.F.R. § 20.2002 for licensing waste disposal by land application, surface discharge, or deep-well injection "as HRI is already contemplating using these alternative methods in some form." ENDAUM and SRIC Phase I Brief at 29-30.[7] As the SER points out, with respect to restoration water, "[c]urrently, HRI would be limited to using either surface discharge (with appropriate State or Federal permits/licenses), brine concentration, waste retention ponds, or a combination of these three options to dispose of [restoration][8] waste water." SER at 26. HRI has not submitted an application to the Commission for deep well injection, surface water discharge, or land application. Accordingly, it need not satisfy the 10 C.F.R. § 20.2002 requirements at this time.

III. National Environmental Policy Act (NEPA)

A. Analysis

As the Staff argues, the FEIS has not been brought seriously into question by the arguments of the Intervenors. Page 30 of the Staff Response declares:

> The 1997 FEIS contains over 250 pages of analysis, not including appendices. Even if all of the criticisms offered by ENDAUM and SRIC regarding the

---

[7] ENDAUM and SRIC do not take issue with HRI's use of evaporation as they admit that it is authorized by 10 C.F.R. Part 40, Appendix A. See ENDAUM and SRIC Phase I Brief at 29 fn. 14.

[8] Although the SER states "process" water here, clearly, the Staff intended to refer to "restoration" water. There are no plans for process water to be surface discharged.

FEIS (*see* SRIC Disposal Brief, at 38-53) were valid (which, as discussed below, they are not), their arguments would fall far short of establishing that the NRC failed to take the "hard look" required by the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 *et seq.* (NEPA).

Indeed, I have reviewed the FEIS carefully and I am impressed by its attention to technical detail and its thoughtful consideration of environmental risks. Intervenors have failed to demonstrate any significant deficiencies.

I am also convinced by the Staff's arguments, at pp. 30-37, that Intervenors have made a variety of errors in characterizing the FEIS. These errors include:

- Mischaracterizing the FEIS's production bleed estimate, which consistently states that the bleed is 1% or 40 g.p.m. of water which is not returned to the aquifer. *See* FEIS, § 4.3.1, at 4-26. In agreement with the FEIS, COP Figures 3.1-2 fn 3.1-1 both show a 40 g.p.m. production bleed for various options of waste water treatment.

- SRIC and ENDAUM, citing page 2-20 of the FEIS, state that 150-250 g.p.m. of water "would be withdrawn during groundwater sweep", and that after treatment, "all those gallons would be re-injected [in]to the aquifer." SRIC Disposal Brief, at 46. This misunderstanding may have been derived from FEIS pages 4-58 to 4-60, estimating consumptive water volumes for each of the proposed ISL mining sites singly, and in combination. At page 2-20, the 150 to 250 g.p.m. flow is represented as an average 200 g.p.m. flow in Figure 2.7. Neither the FEIS text on page 2-20, or Figure 2.7, states that restoration would result in reinjection of all withdrawn water. Rather, the text on page 2-20 states that the permeate (clean water produced by the reverse osmosis treatment option) would be reinjected into the aquifer. Figure 2.7 shows restoration flows for various restoration options, and shows that a 200 g.p.m. restoration flow would produce 150 g.p.m. of clean water (permeate), and 50 g.p.m. of waste water.

- ENDAUM and SRIC state that the FEIS does not discuss evaporation ponds in terms of soil impact from ground disturbance. *See* SRIC Disposal Brief, at 48. However, impacts to soils from evaporation pond construction are described on pages 4-6 to 4-14 of the FEIS, along with estimates of disturbed acreage for various alternatives.

- ENDAUM and SRIC incorrectly state that evaporation ponds are left out of the FEIS discussion on how ground water must be protected from the

effects of pond leakage. *Compare* SRIC Disposal Brief, at 48 with FEIS pages 4-25 to 4-26. See also HRI License Condition 10.5 (providing additional safeguards)

- SRIC and ENDAUM erroneously state that evaporation ponds may overflow. This is a misconception, as HRI License Condition 10.5 requires that enough space be left within each pond container (freeboard requirement) so that if a leak occurs in a pond, there will be enough space in other ponds so that the contents of the leaky pond can be transferred to other ponds to prevent further leakage.

- SRIC and ENDAUM incorrectly state that the FEIS only considered impacts for the 80 acres in Section 17 that might be used for land application disposal of liquid waste. However, as was stated on FEIS page 4-11, the NRC Staff assumed that land application at the Church Rock site could occur on any of the four sections but that no more that 640 acres would be affected. *See also* HRI License Condition 11.8, which requires advance approval for land application; FEIS pages 4-7 and 4-10 to 11.

- ENDAUM and SRIC are incorrect in their concern about the significance of the omission of manganese, molybdenum, and selenium from HRI's water quality data. These elements have been measured and are either absent or are present only in insignificant amounts. *See* Table 29-1 of HRI's response to RAI 29 (pregnant lixiviant data); *see also* HRI's December 9, 1998 filing, at 51.

- Contrary to SRIC and ENDAUM's arguments, the FEIS gave adequate consideration to impacts on water fowl. *See* FEIS § 4.7.3, at 4-91 to 4-92.

Intervenors' also presented overtopping concerns pertaining to rainfall, wind and wave action, and operator error. It is difficult to imagine how maximum rains in McKinley County, New Mexico could result in overtopping, as the Probable Maximum Precipitation (PMP) is 8.9 inches. In any event, in accordance with License Condition 10.26(d), prior to injecting lixiviant at Churchrock, HRI must receive NRC acceptance that the waste retention ponds are designed to accomodate the Probable Maximum Flood. Further, wind and wave action are covered by License Condition 10.26, which requires HRI to comply with

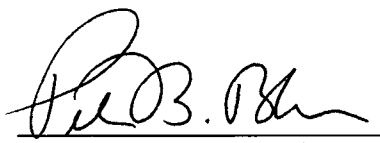
NRC guidance which sets requirements with respect to these factors. Intervenors also have not sustained their concern that operator error may cause overfilling of the ponds. HRI is committed to conduct operations so that pond freeboard is maintained and it has adopted proper Standard Operating Procedures (SOPs), as stated in the COP Rev. 2 § 9.16 and as required by License Condition 9.8. COP Rev. 2 § 9.16 at 153-154; License Condition 9.8.

ORDER

For all the foregoing reasons and upon consideration of the entire record in this matter, it is this 3rd day of February, 1999, ORDERED, that:

1. Eastern Navajo Diné Against Uranium Mining, the Southwest Research and Information Center, Grace Sam and Marilyn Morris are denied relief with respect to their area of concern related to waste disposal issues.

2. This decision is reviewable under 10 C.F.R. § 2.1253, pursuant to the procedures set forth in 10 C.F.R. § § 2.786 and 2.763. The petition for review must be filed within 15 days of the service of this decision..



Peter B. Bloch, Administrative Judge
Presiding Officer

Rockville, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

HYDRO RESOURCES, INC.

Docket No.(s) 40-8968-ML

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB PID (LBP-99-1) DTD 2/3/99 have been served upon the following persons by U.S. mail, first class, except as otherwise noted and in accordance with the requirements of 10 CFR Sec. 2.712.

Office of Commission Appellate
Adjudication
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Administrative Judge
Peter B. Bloch
Presiding Officer
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Administrative Judge
Thomas D. Murphy
Special Assistant
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555

John T. Hull, Esq.
Mitzi A. Young, Esq.
Office of the General Counsel
Mail Stop - O-15 B18
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Diane Curran, Esq.
Harmon, Curran, Spielberg & Eisenberg
2001 S Street, N.W., Suite 430
Washington, DC 20009

Douglas Meiklejohn, Esq.
New Mexico Environmental Law Center
1405 Luisa Street, Suite 5
Santa Fe, NM 87505

Jep Hill, Esq.
Attorney for Hydro Resources, Inc.
Jep Hill & Associates
P.O. Box 2254
Austin, TX 78768

Herb Yazzie, Attorney General
Steven J. Bloxham, Esq.
Navajo Nation Department of Justice
P.O. Box 2010
Window Rock, AZ 86515

Docket No.(s)40-8968-ML
LB PID (LBP-99-1) DTD 2/3/99

Wm. Paul Robinson
Chris Shuey
Southwest Research and Information Center
P.O. Box 4524
Albuquerque, NM 87106

Mitchell Capitan, President
ENDAUM
P.O. Box 471
Crownpoint, NM 87313

Anthony J. Thompson, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N Street, NW
Washington, DC 20037

Grace Sam
P.O. Box 85
Church Rock, NM 87311

Roderick Ventura
Samuel D. Gollis
DNA - People's Legal Services, Inc.
P.O. Box 306
Window Rock, AZ 86515

Dated at Rockville, Md. this
3 day of February 1999

Adria T. Byrdsong
Office of the Secretary of the Commission